

31

Date: Tuesday, 6/26/2007 3:09:36 PM
 User: Kim Johnston

Process Sheet

Customer:	: CU-DAR001 Dart Helicopters Services	Drawing Name	: OH-58 AFT X-TUBE ASSEMBLY - UNDER REVIEW
Job Number	: 33152		
Estimate Number	: 10246		
P.O. Number	: N/A	Part Number	: D058676201
This Issue	: 6/26/2007 S.O. No. : N/A	Drawing Number	: D058-676-241 REV A2
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: N/A Type : LANDING GEAR	Drawing Revision	: A2 UNDER REVIEW PH 07.06.27
Previous Run	: 33151	Material	: N/A
Written By	: <u>JA 07.06.27</u>	Due Date	: 7/30/2007 Qty: 1 Um: Each
Checked & Approved By	: <u>JA 07.06.27</u>		
Comment	: Est Rev: 04.02.16 Reformat KJ/DS		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	DC	DOCUMENT CONTROL
-----	----	------------------



Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D058-676-201CHG001

2.0	D6007106	Crosstube
-----	----------	-----------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

Qty Part number Description Batch

1 D6007-106 Crosstube B28299

Check OD = 2.250"; ID = 1.550"

3.0	MORI SEIKI	MORI SEIKI CNC LATHE LARGE
-----	------------	----------------------------



Comment: MORI SEIKI CNC LATHE LARGE

1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA086

2-Turn first side as per Folio FA086

3-Deburr & Inspect for surface damage.

4.0	QC1	INSPECT ALL DIM TO DIM SHEET
-----	-----	------------------------------



Comment: INSPECT ALL DIM TO DIM SHEET

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

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Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Turn second side as per Folio FA086

2-Deburr & Inspect for surface damage.

8.F 07/11/08

6.0

QC1

INSPECT ALL DIM TO DIM SHEET



Comment: INSPECT ALL DIM TO DIM SHEET

8.F 07/11/08

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

20 07/11/08

8.0

MORI SEIKI

MORI SEIKI CNC LATHE LARGE



Comment: MORI SEIKI CNC LATHE LARGE

1-Remove sand and plugs

2-Scribe part # and batch # using vibrating stylus as per Dwg D058-676-241
Inside of Cuff(Donot engrave on outside of tube)

8.F 07/11/08

9.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Polish entire outside surface of crosstube

DP 7-11-9

10.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

7-11-12 ①

11.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1 within 24 hours of machining

SR/EL 7-11-12

W/O:		WORK ORDER CHANGES					
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Job Number: 33152

Part Number: D058676201

Job Number:



Seq. #:

Machine Or Operation:

Description:

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

DP 7-11-12

13.0

BENDING

BENDING MACHINE



Comment: BENDING MACHINE

Bend tube as per Dwg D058-676-241 using CNC bender program OH58-af and Folio FT

EL 7-11-12

14.0

QC6

DIMENSIONAL CHECK



Comment: Inspect dimensions and work To Current Step

JA 7-11-12 (1)

15.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill pilot holes in tube as per Dwg D058-676-241 using drill Jig DT8541 & DT8542

2-Ream hole to finish size in tube as per Dwg D058-676-241 using drill Jig DT8541 & DT8542. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D058-676-241

JK 7-11-13

JD 7-11-13

16.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1 within 24 hours of bending and drilling

JD 7-11-13

17.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

JA 7-11-15 (1)

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

JA 7-11-15 (1)

19.0

OUTSIDE SERV. 10

OUTSIDE SERVICES -LG



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 0380

Issue P/O: 5068

LPI as per ASTM 1417 Level 2

CS 7/11/19 (1)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Job Number: 33152

Part Number: D058676201

Job Number:



Seq. #:

Machine Or Operation:

Description :

Attach copy of NDT results to work order

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage Ensure copy of NDT results attached to work order.

Per Mike

21.0

QC6

DIMENSIONAL CHECK



Comment: Inspect for damage & ensure results are as per Dwg D058-676-241

7-11-19 (1)

22.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

ml 07 11 21 (1)

23.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Then, Wrap in plastic bag to protect from scratches

85 07 - 11 - 22

24.0

D2856400

Abrasion Strip



Comment: Qty.: 0.5800 f(s)/Unit Total : 0.5800 f(s)

Pick:

Qty Part number

Description

Batch

2 D2856-400-694 Abrasion Strip

34642

ml 07 11 24

25.0

D28911

Support 2.25 dia



Comment: Qty.: 2.0000 Each(s)/Unit Total : 2.0000 Each(s)

Pick:

Qty Part number

Description

Batch

2 D2891-1

Support *29108*

ml 07 11 24

W/O:		WORK ORDER CHANGES					
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Job Number: 33152

Part Number: D058676201

Job Number:



Seq. #:

Machine Or Operation:

Description :

26.0

MS2192020

Clamp (per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick:

Qty Part number

Description Batch

4 MS21920-20

Clamp 102787

ml 07 11 24

27.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Install abrasion strips as per QSI 035 using DT8579

2-Install supports and clamps as per Dwg D058-676-241. Torque clamps to 80-100 in lb.

ml 07 11 24 (1)

28.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

07/16/27 (20)

29.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

30.0

AN532A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 AN5-32A

Bolt M104935

SP

31.0

AN960JD516

Washer



Comment: Qty.: 8.0000 Each(s)/Unit Total : 8.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

8 AN960JD516

Washer M104156

7/11/27 SP (1X)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes ☒ No ☐ DQA: PD Date: 01/17/07
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
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Job Number: 33152

Part Number: D058676201

Job Number:



Seq. #:

Machine Or Operation:

Description :

32.0

MS21042L5

Nut



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)

Pick: Packing Kit

Qty Part number

Description Batch

4 MS21042L5

Nut (or -5)

1105436

7/11/27 50 (ix)

33.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

5 7/11/27 (cc)

34.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and pack for shipping as per PPP D058-676-201

Location:

Rev B

AS 07/11/27 (xi)

35.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

2 08/11/27

Job Completion



CL 07-11-27

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	33152
Description: Crosstube Assembly (OH-58 High Aft)	Part Number:	D058-676-241
Inspection Dwg: D058-676-241 Rev: A2		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article
 ☐ Prototype

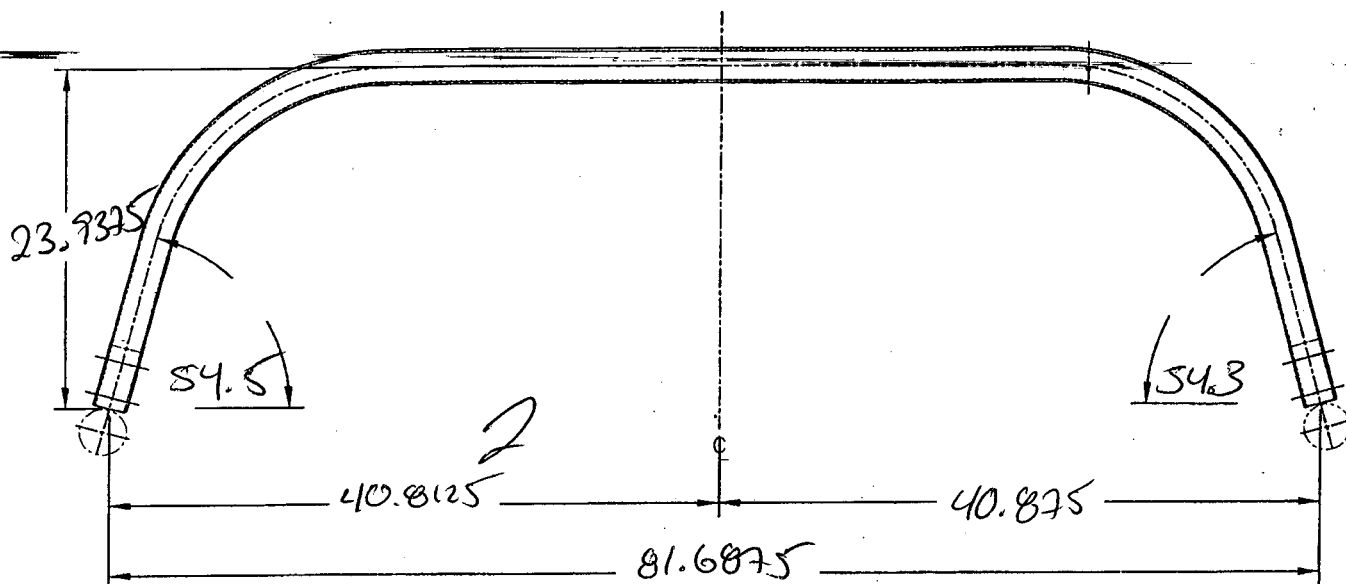
Inspection Sheet Drawing Dimension		Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.244	✓			
	1.870	+0.005/-0.000	1.875	✓			
	1.956	+0.005/-0.000	1.960	✓			
	2.045	+0.005/-0.000	2.048	✓			
	2.093	+0.005/-0.000	2.093	✓			
	2.140	+0.005/-0.000	2.142	✓			
	2.188	+0.005/-0.000	2.190	✓			
	2.228	+0.005/-0.000	2.228	✓			
	0.186	+0.005/-0.000	.180	✓			
	0.500	+0.005/-0.000	.500	✓			
	R0.063	+0.005/-0.000	.063	✓			
	R0.500	+0.005/-0.000	.500	✓			
SIDE B	103.51	+0.005/-0.000	103.51	✓			
	2.240	+0.005/-0.000	2.243	✓			
	1.870	+0.005/-0.000	1.875	✓			
	1.956	+0.005/-0.000	1.960	✓			
	2.045	+0.005/-0.000	2.050	✓			
	2.093	+0.005/-0.000	2.093	✓			
	2.140	+0.005/-0.000	2.145	✓			
	2.188	+0.005/-0.000	2.191	✓			
	2.228	+0.005/-0.000	2.228	✓			
	0.186	+0.005/-0.000	.180	✓			
	0.500	+0.005/-0.000	.500	✓			
	R0.063	+0.005/-0.000	.063	✓			
	R0.500	+0.005/-0.000	.500	✓			

Measured by: <i>RF</i>	Audited by: <i>RP</i>	Prototype Approval:	N/A
Date: 07/11/08	Date: 07/11/08	Date:	N/A
Rev	Date	Change	Revised by Approved
A	05.04.27	New Issue (P/O D058-676-201)	KJ/JLM <i>[Signature]</i> <i>[Signature]</i>

DART AEROSPACE LTD		Work Order:	33152
Description: Crosstube High Aft (OH-58)		Part Number:	D058-676-201
Inspection Dwg: D058-676-241 Rev: A 2		Page 1 of 1	

011 07.06.27

Required Dimension	Min	Max
Height	23.92	24.04
1/2 Span	40.86	40.98
Angle	54	56
Total Span	81.72	81.96



Comments

QC15 Inspection	
Date	07.11.12

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>CP</i>	APPROVED <i>CP</i>	DRAWING NO. D058-676-241	REV. A SHEET 1 OF 3
DATE 00.11.17		TITLE CROSSTUBE ASS'Y (OH-58 HIGH AFT) NTS	
A	00.11.17	NEW ISSUE	

Qty	Part Number	Description
X	D058-676-241	CROSSTUBE ASSEMBLY (OH-58 HIGH AFT)
1	D6007-106	CROSSTUBE
2	D2856-400-694	ABRASION STRIP
2	D2891-1	SUPPORT
4	MS21920-20	CLAMP

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 2) MATERIAL: MANUFACTURED FROM D6007-106
FINISHED LENGTH = 103.51±0.020
- 3) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 4) PART IS SYMMETRIC ABOUT CENTERLINE.
- 5) RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- 6) MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 7) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 8) SCRIBE DART PART NUMBER AND BATCH NUMBER IN THIS AREA WITH VIBRATING STYLUS.
- 9) INSTALL D2856-400-694 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D2891-1 SUPPORT, PER QSI 035.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) SEAL EDGES OF SUPPORTS AND ABRASION STRIP USING SIKAFLEX-241/291 SEALANT.
- 12) TORQUE CLAMPS 80 TO 100 IN-LB.

UNDER REVIEW

06.10.18 PH

Update view 0-0

PH 07.06.26

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 33152

RELEASED
00.11.24 *CP*

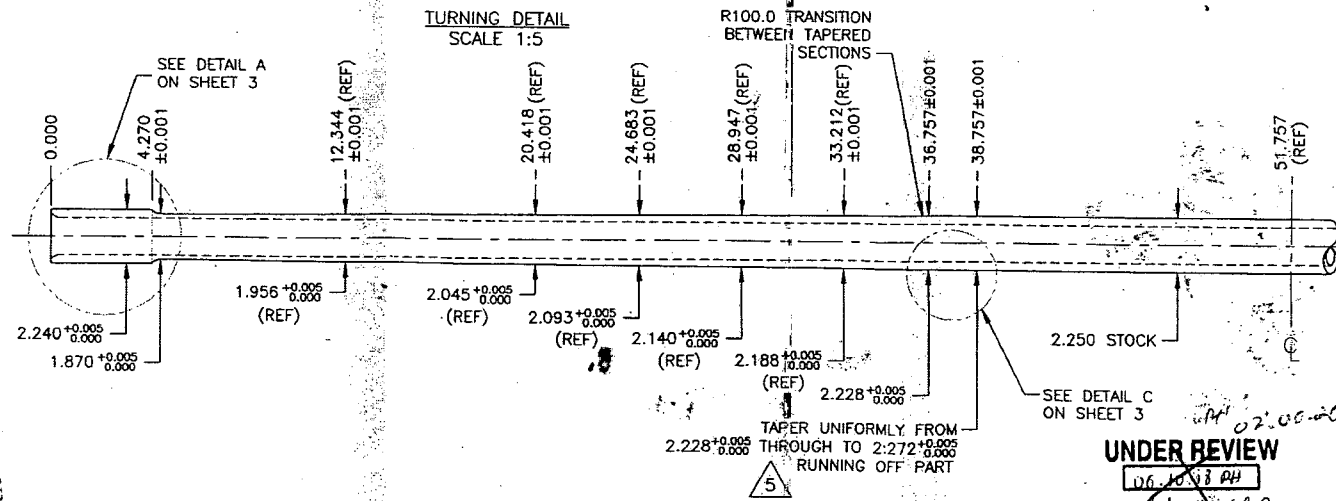
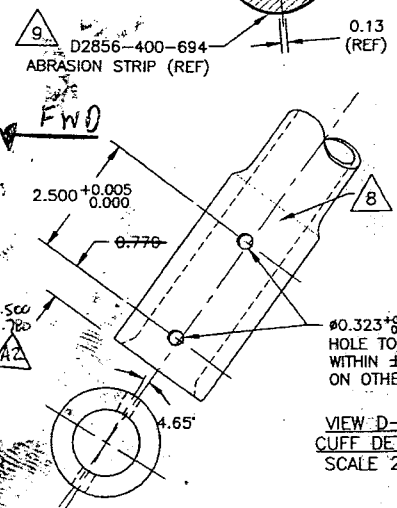
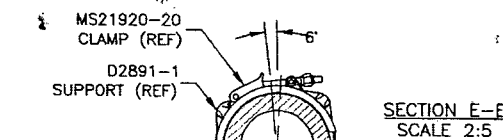
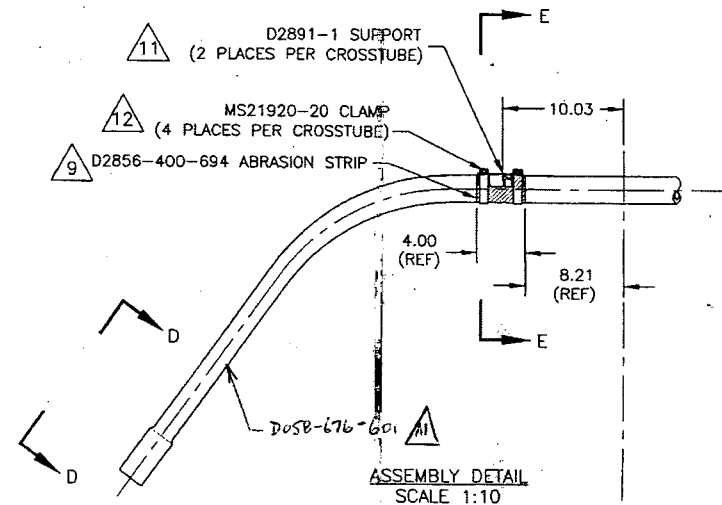
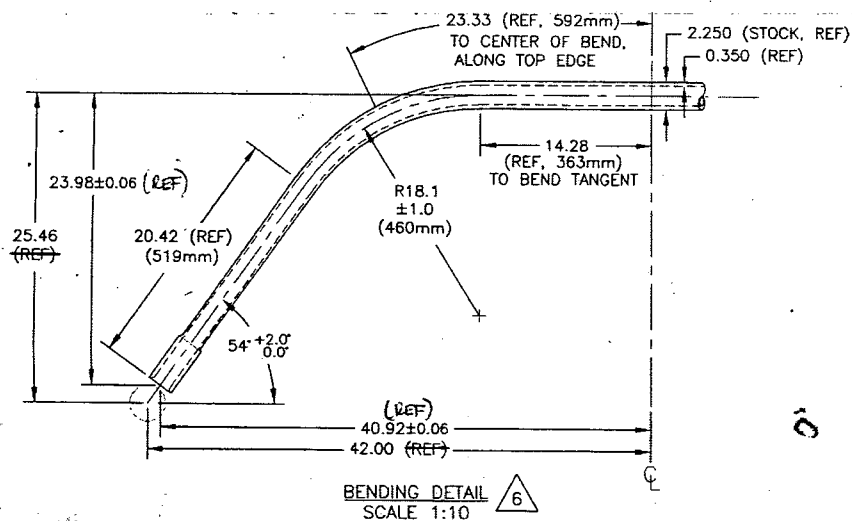
A2	01.07.16	UPDATE DIM TO FIRST HOLE	<i>CP</i>
A1	01.03.07	ADD D058-676-601 P/N	<i>CP</i>

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RELEASED
00.11.24

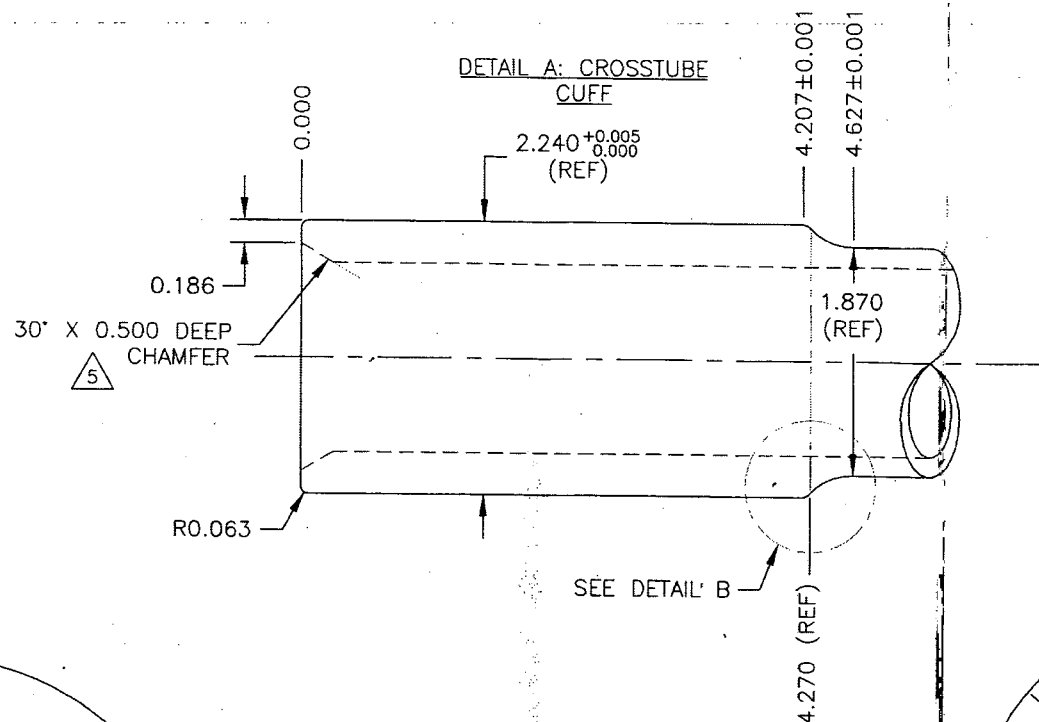


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DATE		00.11.17		DRAWING NO. D058-676-241
				TITLE CROSSTUBE ASS'Y (OH-58 HIGH ALT)

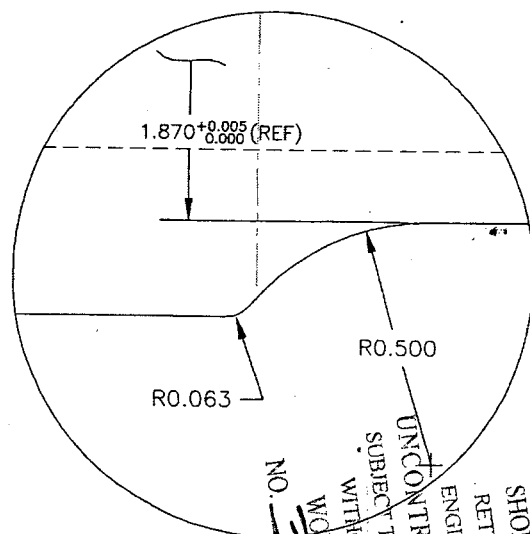
UNDER REVIEW

06.10.03 AH
Update View P-D

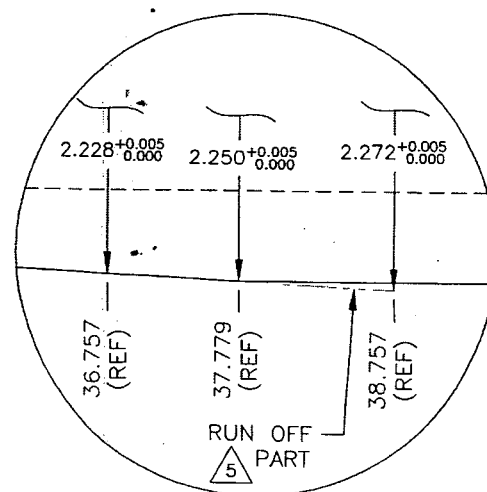
RELEASED
00.11.24



UNDER REVIEW
06.10.24 PH
Update view 0-0
PH
02.06.25



DETAIL B:
CUFF TRANSITION
SCALE 4:1



DETAIL C:
TAPER RUN-OFF
NOT TO SCALE

NO. 33152
WORK ORDER
SUBJECT TO AMENDMENT
WITHOUT NOTICE
UNCONTROLLED COPY
ENGINEERING
RETURN TO
SHOP COPY

COPYRIGHT © 2000 BY DART AEROSPACE LTD.		DESIGN	CP	DRAWN BY	CP	DART	DART AEROSPACE LTD. HAWKESBURY, ONTARIO, CANADA
THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.		CHECKED	PH	APPROVED	PH	DRAWING NO.	REV. A
		DATE	00.11.17			D058-676-241	SHEET 3 OF 3
						TITLE	SCALE
						CROSSTUBE ASS'Y (OH-58 HIGH AFT)	1:1





LIQUID PENETRANT TEST REPORT

P - 1200 1

PAGE 1 OF 2

CLIENT	DART AEROSPACE	DATE	NOV 16 2007	TIME	AM <input type="checkbox"/> PM <input type="checkbox"/>
ATTENTION	LINDA LACELLE	ACUREN JOB NO.	188 07 1200		
ADDRESS	1270 ABERDEEN ST	PO/NO.	5068		
	HAWKESBURY, ONT.	WORK LOCATION	HAWKESBURY		
		ACCEPTANCE STD.	ASTM 1417/QSI-038	REV./DATE	2005
PROJECT	OH 58 FWD/AFT, 206LFWD/AFT, 407 HIGH AFT X TUBES				
ITEM(S) EXAMINED	JOB #S OH 58: 33146,33147,33148,33152,35532,35533,35534,35535. JOB#S 407: 33327				
	JOB #S 206L: 35043,35305,35306.				

JOB DESCRIPTION	PROCEDURE NO. LT-0002 REV./DATE	TECHNIQUE NO. LT-TECH2 REV./DATE
'PART NO. D206667203/D206667103BL/D05876101,201/D407667205 MATERIAL ALODINED ALUM. THICKNESS		
SCOPE WET FLOURESCENT LIQUID PENETRANT INSPECTION CARRIED OUT ON 100% EXTERNAL SURFACE		

TEST DETAILS

METHOD	<input checked="" type="checkbox"/> FLUORESCENT	<input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH	<input type="checkbox"/> SOLVENT REMOVABLE	<input type="checkbox"/> POST EMULSIFIED
FAMILY BRAND	MAGNAFLUX		BLACK LGHT8171	<input type="checkbox"/> OUTPUT > 1000 μ W/cm ²	<input type="checkbox"/> AMBIENT < 2 fc
PENETRANTZL67	MINIMUM DWELL TIME	45 MIN.	LIGHTING EQUIP.	<input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT	<input type="checkbox"/> OUTPUT > 100 fc @ SURFACE
PENETRANT REMOVER H2O	MINIMUM DRY TIME	> 10 MIN.	OTHER	CAL SEP 18 07	
DEVELOPER SKDS2	MINIMUM DWELL TIME	10 MIN.	LIGHT METER S/N	CAL DUE DATE	
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS	<input type="checkbox"/> AQUEOUS	<input type="checkbox"/> DRY		

TEST SURFACE

SURFACE CONDITION	<input type="checkbox"/> AS GROUND	<input checked="" type="checkbox"/> AS WELDED	<input type="checkbox"/> MACHINED	<input type="checkbox"/> SHOT BLASTED	<input checked="" type="checkbox"/> CLEAN BARE METAL
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F	<input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input type="checkbox"/> 10°C/50°F TO 52°C/125°F	<input type="checkbox"/> > 52°C/125°F	

RESULTS- (☐ METRIC ☒ IMPERIAL)

FLUORESCENT LIQUID PENETRANT INSPECTION
CARRIED OUT ON 100% EXTERNAL SURFACE ON:

206L FWD X TUBES JOB#s 35305
206L AFT X TUBES JOB#s: 35043,35306
OH58 FWD X TUBES JOB#s: 33146,33147,33148,35532
OH58 AFT X TUBES JOB#s: 33152,35533,35534,35535
407 HIGH AFT TUBE JOB#: 33327

RESULTS: NO INDICATION OF DEFECTS.
ITEMS ACCEPTABLE TO STANDARD.

Scope of Services
The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner operator and the owner operator retains complete responsibility for the engineering, manufacture, repair and use decisions as a result of the data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

Standard of Care
In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, expressed or implied, is made or intended by Acuren Group Inc.

SIGNATURES

CLIENT REPRESENTATIVE		DTR # E 27347
TECHNICIAN (SIGNATURE):		REPORT REVIEWED BY:
NAME (PRINT):	JASON HEWETT	NAME INITIALS
	1 ST TECHNICIAN	
CGSB LEVEL 2 SNT LEVEL	CGSB LEVEL SNT LEVEL	
CGSB REG. NO 6156	CGSB REG. NO	

WHITE - CLIENT COPY

CANARY - OFFICE COPY

PINK - TECHNICIAN COPY

GOLD - OFFICE COPY